

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 04 OCT 2004

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Applicant's or agent's file reference P0786		<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/GB2004/000119		International filing date (day/month/year) 16.01.2004	Priority date (day/month/year) 18.01.2003	
International Patent Classification (IPC) or national classification and IPC H05B3/74				
Applicant CERAMASPEED LIMITED et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  13.08.2004		Date of completion of this report  01.10.2004		
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Gea Haupt, M  Telephone No. +49 89 2399-6938		



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ON PATENTABILITY**

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-3, 6-12	as originally filed
4, 5	filed with telefax on 13.08.2004

**Claims, Numbers**

7-18	as originally filed
1-6	filed with telefax on 13.08.2004

**Drawings, Sheets**

1/2-2/2	as originally filed
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- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-18
	No: Claims	
Inventive step (IS)	Yes: Claims	1-18
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: EP-A-0 981 263 (CERAMASPEED LTD) 23 February 2000 (2000-02-23)  
D2: EP-A-0 948 238 (CERAMASPEED LTD) 6 October 1999 (1999-10-06)

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

A radiant electric heater comprising a base(2) of thermal and electrical insulation material having a surface supporting at least one electric heating element(3) comprising at least one elongate electrically conductive ribbon(4), the at least one electrically conductive ribbon(4) being supported on edge; a rod-like temperature-responsive device(7,8) extending lengthwise partly across the heater from an edge thereof and over the at least one electric heating element(3); the surface of the base(2) being provided with an elongate recess with sloping sides extending beneath and along the length of the rod-like temperature-responsive device(7,8)(abstract; figure 2).

The subject-matter of claim 1 differs from this known radiant electric heater in that the at least one electrically conductive ribbon is supported in and traverses the elongate recess such that an upper edge of the at least one electrically conductive ribbon substantially follows a contour of the surface of the recess.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as how to provide an arrangement of temperature-responsive device and electrically-conductive ribbon which maintains the majority of the upper surface of the ribbon at a constant distance from a cooking plate (needed for uniform heating) but which provides the ribbon safely distances from the temperature-responsive device.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) because such a disposition of the ribbon and the temperature-responsive device disclosed in it is neither

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known, nor rendered obvious by D1 (or any other document part of the prior art). Document D2 discloses an arrangement where the base of a heater is profiled in the form of a section of a sphere. Therefore, the combinations of the teachings of D1 and D2 would also not result in a heater according to claim 1. Additionally, the above-mentioned technical problem is also not addressed by D1.

Claims 2 to 18 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

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## CLAIMS

1. A radiant electric heater (2) comprising: ✓
- 5 a base (8) of thermal and electrical insulation material having a surface supporting at least one electric heating element comprising at least one elongate electrically conductive ribbon (10), the at least one electrically conductive ribbon (10) being supported on edge; ✓
- 10 a rod-like temperature-responsive device (16) extending lengthwise partly across the heater (2) from an edge thereof and over the at least one electric heating element (10);
- 15 the surface of the base (8) being provided with an elongate recess (22) with sloping sides (24, 26) extending beneath and along the length of the rod-like temperature-responsive device (16), ✓
- 20 characterised by the at least one electrically conductive ribbon (10) being supported in and traversing the elongate recess (22) such that an upper edge (28) of the at least one electrically conductive ribbon (10)
- 25 substantially follows a contour of the surface of the recess and whereby the upper edge (28) of the at least one electrically conductive ribbon (10) at a region (30) underlying the rod-like temperature-responsive device (16) is provided at a predetermined distance from the
- 30 rod-like temperature-responsive device (16) and is at a

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lower level relative to the upper edge (28) of the at least one electrically conductive ribbon (10) at regions (32, 34) at either side of the elongate recess (22), the at least one electrically conductive ribbon (10) in the regions (32, 34) at either side of the elongate recess (22) being provided on a substantially planar surface of the base.

2. A heater as claimed in claim 1, characterised in that the rod-like temperature-responsive device (16) comprises metal.
3. A heater as claimed in claim 1 or 2, characterised in that the rod-like temperature-responsive device (16) comprises a metal tube.
4. A heater as claimed in any preceding claim, characterised in that the rod-like temperature-responsive device (16) has a first end supported at an edge region of the heater (2) and a second end (18) substantially unsupported at an inner region of the heater (2).
5. A heater as claimed in any preceding claim, characterised in that the elongate recess (22) has a width which increases with increasing distance from the edge of the heater (2).
6. A heater as claimed in any preceding claim, characterised in that the elongate recess (22) has a depth which increases with increasing distance from the edge of the heater (2).

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responsive device and the underlying heating element or elements.

It is an object of the present invention to overcome or  
5 minimise this problem.

According to the present invention there is provided a radiant electric heater comprising:

- 10 a base of thermal and electrical insulation material having a surface supporting at least one electric heating element comprising at least one elongate electrically conductive ribbon, the at least one electrically  
15 conductive ribbon being supported on edge;
- a rod-like temperature-responsive device extending lengthwise partly across the heater from an edge thereof and over the at least one electric heating element;
- 20 the surface of the base being provided with an elongate recess with sloping sides extending beneath and along the length of the rod-like temperature-responsive device,
- wherein the at least one electrically conductive ribbon  
25 is supported in and traverses the elongate recess such that an upper edge of the at least one electrically conductive ribbon substantially follows a contour of the surface of the recess and whereby the upper edge of the at least one electrically conductive ribbon at a region  
30 underlying the rod-like temperature-responsive device is provided at a predetermined distance from the rod-like

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temperature-responsive device and is at a lower level relative to the upper edge of the at least one electrically conductive ribbon at regions at either side of the elongate recess, the at least one electrically  
5 conductive ribbon in the regions at either side of the elongate recess being provided on a substantially planar surface of the base.

The rod-like temperature-responsive device may comprise  
10 metal and may comprise a metal tube.

The rod-like temperature-responsive device may have a first end supported at an edge region of the heater and a second end substantially unsupported at an inner region  
15 of the heater.

The elongate recess may have a depth which increases with increasing distance from the edge of the heater.

20 The elongate recess may also have a width which increases with increasing distance from the edge of the heater and may be such that a substantially constant angle of the sloping sides of the elongate recess is maintained as the depth of the elongate recess increases with increasing  
25 distance from the edge of the heater.

The elongate recess may be of substantially shell or scallop form.

30 The at least one electrically conductive ribbon may be of corrugated form and may be provided with a plurality of spaced-apart legs, integral with the at least one

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